

REMARKS

In response to the Office Action of March 22, 2011, applicant has canceled independent claims 4 and 9 (and the claims dependent thereon, namely, claims 5-8 and 12-14) in order to focus on independent claim 22 and its dependent claims (claims 23-27). This response will address specifically the substance of the rejections of all the claims but will, of course, focus on the rejections as specifically applied to claim 22 and its dependent claims.

Claims 4, 14, and 22 have been rejected under 35 USC §103 over Konishi ("Determination of acetabular coverage of the femoral head with use of a single anteroposterior radiograph. A new computerized technique", Journal of Bone and Joint Surgery, 1993, vol. 75, pp1318-1333) in view of Sarin et al. (US 20040254586).

The Examiner asserts that Konishi teaches a method for determining transaxial rotation of a pelvis from a single fluoroscopic image without using a patient tracker by determining the axial displacement of first and second landmarks on the image that are separated from each other in at least an anterior-posterior direction, referring to Figure 3 of Konishi. Figure 3 is not an AP image: it is a lateral image; see the caption of this Figure:

To obtain the estimation formula and to certify its accuracy, the real rotation of the pelvis in the sagittal plane was measured from an average of two reference angles on the *lateral radiograph*...

(emphasis added).

Further, Konishi does not determine the axial displacement of first and second landmarks from said image; rather, he uses the height of the obturator foramen. This

structure does not provide *landmarks...separated from each other in at least an anterior-posterior direction*, as called for in claim 22, nor does its extent lie on *anatomically separated regions* of said pelvis of the image as now also called for. Nor does Konishi teach that the AP image is to be an *intraoperative* image, or that a *patient-specific pelvic coordinate system* can be formed from it, all of which is called for in claim 22. Indeed, Konishi discloses that the method that he teaches has limited applicability:

This method makes it possible to calculate three dimensional coordinates of points on the edge of the acetabulum with use of an anteroposterior radiograph of the hip (Fig. 1). *Any point of the acetabular edge is postulated to be located on an approximately spherical surface of the acetabulum. The method is therefore not suitable for hips in which the acetabulum and femoral head are not spherical or congruent.* (Detailed equations are given in Appendix I.)

Konishi, page 1318, "Technique" (emphasis added).

The Examiner admits that Konishi does not expressly teach using first and second landmarks to find the axial rotation in the near AP image, but asserts that Sarin does and that it may properly be combined with Sarin to meet the terms of claim 22. This is not correct. Sarin teaches an *image-free* method of defining a pelvic plane by wholly *mechanical* means. In Sarin's own words:

[0010] The invention includes a method of determining the plane of a surgical patient's pelvis and inputting that plane into a computer via a tracking system, suitable for use in navigating partial or total hip replacement surgery, comprising the steps of: *aligning the patient in relation to a patient positioning frame with pelvic anatomical features of the patient disposed in secure mechanical relationship with corresponding patient-engaging features on the positioning frame; acquiring with a tracking system the positions of a plurality of index points, the index points constrained to lie in a*

predetermined relationship with an anterior pelvic plane (APP) defined by the patient-engaging features; and defining a pelvic plane by calculation based upon the acquired positions of the index points and the predetermined relationship between the APP and the index points.

(Sarin, ¶[0010], emphasis added). The paragraphs cited by the Examiner [0011], [0025] [0041], and [0042], simply describe Sarin's mechanical frame and its alignment with three anatomical landmarks, namely, the anterior-superior iliac spines and the pubic symphysis. The identification of the anterior-superior iliac spines and the pubic symphysis as useful landmarks appears to be the only relevance of Sarin to applicant's invention. However, applicant himself has pointed out that these are well-known surgical landmarks:

Common landmarks for a pelvic coordinate system are the two anterior superior iliac spines and the pubic symphysis.

(applicant's specification, page 3, lines 12-13). Applicant does not claim to have discovered that these are useful landmarks. What is inventive is the way that applicant uses landmarks, well-known or otherwise.

¶[0051] and ¶[0052] also cited by the Examiner of Sarin add nothing to this. ¶[0051] discusses orienting a mechanical touchplate to the patient's anterior- pelvic plane, and ¶[0052] discusses the use of trackers in connection with the mechanical frame. Nowhere is there a discussion of using an image of any kind to define the AP plane. Thus, not only is Sarin devoid of any teaching which could fill the gaps in Konishi, but is so remote from providing any teaching relevant to applicant's claims that there is absolutely no basis for combining Sarin with Konishi.

Claims 5-6, 9, and 24-25 have also been under 35 USC §103 over Konishi in view of Sarin for the same reasons given with respect to claims 4, 14, and 22. Applicant's extended discussion of the latter rejection above also apply to these claims.

With respect to the Examiner's comments regarding 23 and 26-27, these claims are dependent either directly or indirectly on claim 22 and thus contain all the distinguishing limitations of claim 22.

Finally, the Examiner makes reference to (but no rejection on) Seeley et al. (US 20030130576) to note that tracking may be used with fluoroscopic imaging. That may be so, but applicant does not use tracking, so Seeley is simply not relevant.

Applicant has made an earnest effort to place the case in condition for allowance and requests that that action be taken.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

/Martin J. O'Donnell
Martin J. O'Donnell
Reg. No. 24,204
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210
Telephone: (617) 951-2500
Facsimile: (617) 951-3927